

## **CHEFS' KNIVES CARRYING CASE AND WORKING PLATFORM**

### **Field of the Invention**

The field of this invention is carrying cases, and more particularly, carrying cases for transporting chefs' knives.

### **Background of the Invention and Discussion of the Prior Art**

A professional kitchen is chaotic environment and it has limited personal space. A professional chef needs to quickly pull out a specialized knife to cut a particular kind of food, put it down, pick up another knife or culinary utensil, work with it and so on. In that environment, it is desirable for the knives to be available to the chef and within convenient and easy reach. Ideally, the knives should be available to be taken by one hand without the need to use the second hand to hold the container for the knives.

Professional kitchens are also short on space. A professional chef has to work with many people each of whom who are performing specialized tasks inside the same kitchen. These typically include sous chefs, cooks, dishwasher, a steward, waiters, bus boys and a kitchen manager. In addition, in traditional french cuisine, there is also the "brigade", which includes the Saute Chef (saucier), The Fish Chef (poissonnier), The Roast Chef (rôtisseur), The Grill Chef (grillardin), The Fry Chef (friturier), The Vegetable Chef (entremetier), The Roundsman (tournant), The Cold-Foods Chef (garde-manger), The Butcher (boucher), The Pastry Chef (pâtissier), The Expéditeur or Announcer (aboyeur), The Commis (an apprentice who works under one of the station chefs listed above). There is also the Maître D' Hôtel, Wine Steward (chef de vin or sommelier), Headwaiter (chef de salle), Captain (chef d'étage), Front Waiter (chef de rang), Back waiter or Busboy (demi chef de rang or commis de rang).

The shortage of space makes it that much more important to have all knives and utensils that are needed in one compact environment which is easy to access. Furthermore, the equipment of the professional chef has to be secure in the sense that when the chef arrives at the kitchen he has to safely store the knives until he is ready to use them without danger of theft. He would prefer to have the knives in a safe storage container the minute he arrives rather than have to transfer the knives from the case he carried them to work in to another case to store and then transfer them back to something that is usable as a work platform.

A work platform for the knives has to allow easy access to them. If the chef has to store the knives in a drawer, and then constantly reach into the drawer to take the knives each time he needs a different knife, this uses up unnecessary time and effort.

Professional chefs use specialized kitchen cutlery that they usually own and which is typically kept at home or in their private possession when not at work. Just like an artist or musician would need to bring his drawing utensils or musical instruments to work, a professional chef brings his specialized knives with him to work and then takes them home with him when the work day is done. Presently, professional chefs bring their knives to work with them sometimes wrapped in a towel, knife roll or wrap.

Various prior art carrying cases are known for knives. See for example U.S. Patent Application Publication No. US 2003/0029770 A1, which is a System for Organizing and Carrying Food Preparation Items. Other commercially available carrying cases are known, such as the Messermeister Soft Side Bag and the 17 Pocket Box-Style Case made of Nylon. The typical high-end knife carrier is a standard flat carrying case that unzips or otherwise opens into two parts, each of which has loops or other attachment means to which knives and related utensils

can securely be inserted and remain attached. Such carrying cases may successfully conceal the knives in the case and may be effective for transporting at least certain kinds of chefs' knives to work. These carrying cases, however, cannot function as an effective work platform for actually using the knives and related utensils in the hectic and space-conscious environment of a professional chef's kitchen.

There are also known work platforms that hold knives. For example, the Deluxe Jumbo Knife Block by Henckels, the Glass Knife Block with Black Base by Sabatier, the Stainless Steel Knife Block by Global High Carbon Stainless Steel and the In-Drawer Knife Storage Block by JK Adams. These work platforms, however, are ineffective for transporting the knives to work since they have no handle and are bulky. They are also not tailored to the shapes of specific specialized knives and tools.

More importantly, they hold knives in a vertical position. For example, the knives they hold are positioned such that they are at an approximately fifty to ninety degree angle with the counter on which the knife block rests. This is problematic for at least two reasons. First of all, the angle makes it awkward for the chef to extend his hand and grasp the handle of the knife to remove the knife from the knife block in a hurry, especially using only one hand. Second of all, this position allows the knife block with the knives to be susceptible to being knocked over. Yet the way these knife blocks are structured, there is no choice but to position the knives at such a drastic upward angle since the knives would fall out if the angle were any less. Furthermore, these knife blocks are not both sufficiently fixed to the kitchen counter that they cannot be moved yet not so fixed that they cannot be easily moved to another place on the counter if necessary.

It is noted that whereas the knives should be sticking up, in contrast, if the knives in the

carrying case were exactly parallel to the counter that the case rests on, it would not be ideal since it also be more difficult to stick one's hand under the handle of the knife to grasp and remove said knife.

Since a kitchen in which professional chefs work is a place that is hectic and short on space there is a need for a carrying case that can also function as an effective working platform that allows easy access by a professional chef to the chef's knives with a single hand. There is a further need for such a device that is sturdy and will not fall over once set up in a particular portion of the kitchen (such as next to the cutting board) and one that does not occupy a significant amount of space in an area where space is a premium. Further, there is a need for such a device that is designed to accommodate the shapes and large number of the wide variety of professional knives and related utensils, like thermometers, meat forks, shears, etc., that professional chefs must have in their work environment. There is also a need for such a device that is a safe way of storing the knives from when the chef arrives at work until the time he begins work. It would be very desirable to have a chef's knives carrying case that meets all the above needs and can also function alternately as a knife block. The present invention does this and more.

### **SUMMARY OF THE PRESENT INVENTION**

A carrying case for chef's knives also functions as a work platform when the device stands on its two planar legs. The legs join together at a spine from which a handle projects outward. Multiple pockets situated in a left and right planar leg of the device are angled so that the chef can single-handedly grab the handle of a knife and put it back. The device stands on its two legs so that the edge of the legs forms a triangle with an edge of the surface the device rests on. A

hollow three dimensional area of substantially triangular cross-section is defined by the legs and the surface that the device rests on. The carrying case also can function as a knife block when vertically attached to a metal surface due to magnets embedded in each leg of the carrying case. Numerous other features of the device make it ideal for working with the knives.

### **IMPORTANT OBJECTS AND ADVANTAGES**

The following important objects and advantages of the present invention are:

- (1) to provide a carrying case for chefs' knives that can be used to transport chefs' knives to a work environment from the chef's home or other place of storage;
- (2) to provide such a device that can transport and hold a large number of such knives;
- (3) to provide such a device that is custom designed to hold almost all standard specialized kitchen knives and related utensils;
- (4) to provide a carrying case that can also function as a work platform in the work setting of a professional chef in the kitchen;
- (5) to provide such a device that can stand on its legs in a sturdy manner and not be knocked over;
- (6) to provide such a device that allows the chef to remove and re-insert knives single-handedly;
- (7) to provide such a device that allows the chef to remove and replace knives conveniently and easily without the need to reach in to a counter or drawer;
- (8) to provide such a device that allows the chef to safely store and work with a large number of all varieties of typically used kitchen knives for chefs;
- (9) to provide a chef's knives carrying case and work platform that is made of two planar

legs and a spine and which also typically includes a handle;

(10) to provide chef's knives carrying case and work platform that has a plurality of pockets specially designed to hold a professional chef's knives;

(11) to provide a chef's knives carrying case and work platform wherein knives placed in the pockets are at an angle to the surface that the carrying case is resting on but not such a big angle that it is awkward to work with them;

(12) to provide a chef's knives carrying case that allows safe storage of the knives when they are not in use;

(13) to provide a chef's knives carrying case and work platform that is compact and uses up a minimum amount of space in a professional chef's kitchen;

(14) to provide a chef's knives carrying case and work platform that is durable and would not have its pockets torn by the blades of the knives;

(15) to provide a chef's knives carrying case and work platform wherein the knives are securely fixed in the case;

(16) to provide a chef's knives carrying case and work platform wherein a combination of multiple pockets, bands, reinforced slits and loops are specially designed to accommodate a wide array of utensils that a professional chef typically works with; and

(17) to provide a chef's knives carrying case and work platform wherein the height of the device can be adjusted by spreading the planar legs of the device to one degree or another;

(18) to provide such a device wherein the device can fold into a flat position and can stand in an open position;

(19) to provide such a device wherein a three dimensional area of triangular cross-section

under the legs is defined by the legs when the device is in a standing position;

(20) to provide a chefs' knives carrying case and work platform that is shaped so that it can hold the specific shapes of chefs' knives that are most often used by professional chefs;

(21) to provide a chefs' knives and work platform which holds the knives in a sufficiently tight fit so that they do not fall out but not so tight that they cannot be conveniently removed by the chef; and

(22) to provide a knives carrying case and work platform that is self-closing

(23) to provide a knives carrying case and work platform that can be attached to a metal wall for storage;

(24) to provide a chef's knives carrying case that includes magnets that are embedded in each leg of the carrying case so that when the device is attached in an open position to a metal refrigerator or other vertical surface the device is in a vertical position and functions as a knife block; and

(25) to provide a knives carrying case and work platform that is designed to accommodate in certain embodiments any configuration of knives and chef's utensils including more than twenty knives, and is specifically designed to accommodate the following knives: Chef's Knife (or French Knife), Utility Knife, Paring Knife, Boning Knife, Filleting Knife, Slicer, Cleaver (comes in a large and intermittent size), Tourny Knife, Serrated Offset Knife, Oyster Knife, and the following utensils: Sharpening Steel, Peeler, Parisienne Scoop (Melon Baller), Kitchen Fork, Palette Knife (Metal Spatula), Offset Spatula, Instant-Read Thermometer, Cork Screw, Zester, Measuring Spoons Tongs, Fish Bone Tweezer, and Kitchen Shears.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a side exterior view of the carrying case for chef's knives of the present invention;

FIG. 2 is an isometric view thereof showing the carrying case from one end and in a standing position;

FIG. 3 is an isometric view thereof in an open/flat position;

FIG. 4 is a top view thereof in an open position;

FIG. 5 is a bottom view thereof in an open position;

FIG. 6 is a side interior view thereof; and

FIG. 7 is an isometric view thereof showing the carrying case from the other end shown in FIG. 1 and in a standing position.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

The apparatus of the present invention will now be illustrated by reference to the accompanying drawings. The carrying case of the present invention has been assigned reference numeral 10. Other elements have been assigned the reference numerals referred to below.

As seen from FIGS. 1-7, a carrying case 10 for chef's knives includes first planar leg 20 and second planar leg 30. Each leg has a minimum of at least one pocket but more typically has multiple pockets. For example, leg 20 is formed primarily of a wall 28 that divides the pockets of first leg 20 into exterior pockets that are on an exterior side of wall 28 and interior pockets that are on an interior side of wall 28 and similarly leg 30 is formed primarily of a wall 38 that divides the pockets of second leg 30 into exterior pockets that are on an exterior side of wall 38 and interior pockets that are on an interior side of wall 38.

In a preferred embodiment, there are at least three exterior pockets on each planar leg and



at least two interior pockets on each planar leg for a total of at least ten pockets not including slits, bands and loops, as explained further below. Ideally, wall 28 has exterior sub-wall 29a and interior sub-wall 29b that are parallel to wall 28 and which do not extend as far forward as does wall 28. Similarly, ideally, wall 38 has exterior sub-wall 39a and interior sub-wall 39b that are parallel to wall 38 and which do not extend as far forward as does main wall 38. For example, and as best seen from FIGS 1-4, first planar leg 20 has exterior sub-wall 29a and interior sub-wall 29b and second planar leg 30 has exterior sub-wall 39a and interior sub-wall 39b.

In addition, as best seen from FIGS. 1-4, first planar leg 20 has left exterior pockets 21, 22, 23 exterior to sub-wall 29a and has right exterior pockets 24, 25 but which can be described as interior (or "to the right of" when looking at a front end view such as in FIG. 1) with respect to sub-wall 29a although they are still exterior to main wall 28. First planar leg 20, as best seen from FIGS. 5-6 has interior pockets 26a, 26b, 26c, the first of which 26a is to the left of sub-wall 29b when viewed from the end view shown in FIG. 1 and adjacent main wall 28 and the next two of which 26b, 26c is to the right of sub-wall 29b when looking from the end shown in FIG. 1 and hence is interior to both sub-wall 29b and main wall 28.

Similarly, in an ideal embodiment, as best seen from FIGS. 1-4, second planar leg 30 has right exterior pockets 31, 32, 33 exterior to sub-wall 39a and has left exterior pockets 34, 35 which are to the left of sub-wall 39a when looked at from the end view shown in FIG. 1 but which are still exterior to wall 38. As best seen from FIGS. 5-6, second planar leg 30 also has interior pockets 36a, 36b, 36c, the first of which 36a is interior to and adjacent main wall 38 (but to the right of sub-wall 39b and the other two of which 36b, 36c are interior to both sub-wall 39b and main wall 38. In this embodiment, there are a total of sixteen pockets not including slits, bands

and loops.

It should be noted that the widths of the pockets in this embodiment vary considerably. For example, the width of interior pockets 26a, 36a is almost equal to the width of walls 28, 38 and can thus perfectly accommodate a cleaver commonly used by professional chefs. On the other hand, four other pockets are of intermediate width to accommodate 12 inch, 10 inch and 8 inch chef's knives and finally left exterior pockets 21, 22, 23 and right exterior pockets 31, 32, 33 and of the smallest width to accommodate such knives as boning knives and paring knives, also commonly employed by professional chefs.

Although the drawings have illustrated the invention showing eight pockets on each planar leg 20, 30, the present invention should not be deemed to be limited in any way to this number of pockets. Furthermore, although the drawings illustrate the pockets being situated in a certain way, the present invention contemplates different pockets that open at different portions of the planar leg and that are of different lengths and widths. In general, the number, width, length, shape and placement of the pockets in the carrying case legs 20, 30 can vary and still be well within the present invention.

It is also contemplated by the present invention to accommodate additional tools on the exterior of the carrying case 10 by utilizing a staggered array of additional slits on the exterior pockets.

It is specifically contemplated by the present invention that the carrying case and working platform 10 be custom designed to fit the collection of specialty knives of a particular environment. For example, in Japan longer knives are typically used than in the United States of America. For that environment, the pockets would be longer and sometimes narrower. Likewise,

for pastry chefs, the pockets would have to be designed to accommodate the shapes of knives such as spatulas and batons (rolling pins). In general, the pockets are specifically to accommodate the most typically used knives and tools of a professional chef.

As noted and demonstrated, one manner of adding pockets would be to add a sub-wall to an exterior side of the walls 28, 38 of planar legs 20, 30 or to the exterior and interior side of said walls 28, 38. However, a person skilled in the art would be able to come up with various other ways to add and modify the pockets consistent with the spirit of the present invention.

It is also contemplated by the present invention that additional pockets can be added by snap-on or modular attachments to the carrying case.

Preferably, each of the pockets 21, 22, 23, 24, 25, 26a, 26b, 26c, 31, 32, 33, 34, 35, 36a, 36b, 36c have stitching defining a boundary of the pocket and of sufficient strength so as to prevent a blade of a knife from tearing said pocket.

Rivets 91, 92, 93, 94, 95, 96 separate one pocket from another at the open ends of the pockets in each leg. For example, there may be two rivets 91, 92 separating three exterior pockets 21, 22, 33 on first planar leg 20 and one rivet 93 separating the two interior pockets 24, 25 on the same leg 20. Similarly, rivets 94, 95 separate exterior pockets 31, 32, 33 on second planar leg 30 and a rivet 96 separate the two interior pockets 34, 35 on second planar leg 30. In addition, at the closed end of the pockets rivets 97, 98, 99, 100, 101, 102 are used to separate the pocket from the edge of the planar leg 20, 30. All pockets are situated at an angle to the surface that the device rests on so that the knives in the carrying case 10 are at an angle to the surface.

Rivets are merely one manner of defining and maintaining the integrity of the pockets. One skilled in the art can design various other manners of accomplishing the same thing. The

present invention is not limited in any way to a device containing rivets. Furthermore, fewer or more rivets can be used in the carrying case.

In general, with the use of at least some properly placed rivets and a strong thread, the knives will not cut the thread.

In addition to pockets for the various kinds of professional knives such as chef's knife, utility knife, paring knife, boning knife, filleting knife, slicer, meat cleaver, tourney knife, serrated offset knife and oyster Knife, first planar leg 20 also has elastic band 66 and second planar leg 30 has elastic band 36 for holding kitchen shears, a cellular telephone or a thermometer. Similarly, each planar leg 20, 30 has a reinforced die cut slit 27, 37 for holding a paring knife or other culinary utensil. Furthermore, on the inside of spine 40, between the two planar legs 20, 30 there is a loop of material 42 for holding a steel sharpener for sharpening the knives.

Spine 40 is formed from a joinder of a side of the first planar leg and a side of the second planar leg. An underside of the spine 40 includes a looped material attached to spine 40 for holding a sharpening steel. On top of spine 40 is handle 50. In order for the weight of device 10 including the knives and utensils inserted therein to be balanced evenly on the two sides of handle 50, handle 50 is situated forward of the center of the device 10 and in particular is near the open end of the pockets 21, 22, 23, 24, 25, 26a, 26b, 26c, 31, 32, 33, 34, 35, 36a, 36b, 36c. Due to the angle of the pockets and knives therein, the center of the weight of the device plus the knives is located forward of center.

Carrying case 10 including handle 50 can be formed by joining together two identical or substantially identical halves - a first planar leg 20 with a half thickness of a handle 50 joined at a spine 40 to a second planar leg 30 with a half thickness of a handle. Handle 50 typically has

portions 51 defining an opening for facilitating grasping handle 50 and for manipulating carrying case 10. In such a case, portions 51 of handle 50 would define the opening such that a largest diameter of the opening is at least one handbreadth, thus allowing for the easy insertion of a human hand.

When planar legs 20, 30 are sufficiently separated from one another, carrying case is capable of standing on planar legs 20, 30 on a surface, with legs 20, 30 defining a three dimensional hollow area of substantially triangular cross section between the surface and said legs 20, 30 so that the carrying case can function as a work platform for knives and/or utensils in the pockets on the legs 20, 30.

The two dimensional shape of planar legs 20, 30 can vary and still be within the scope of this invention. In a preferred embodiment, the legs 20, 30 would be as shown in the drawings, However, the present invention contemplates other shapes of planar legs 20, 30. For example, as seen in FIGS. 1-7, at the end of planar legs 20, 30 adjacent the closed end of pockets, 21, 22, 23, 24, 25, 26a, 26b, 26c 31, 32, 33, 34, 35, 36a, 36b, 36c is curved. However, other shapes are contemplated at the end of legs 20, 30. Furthermore, the degree of the angle that pockets 21, 22, 23, 24, 25, 26a, 26b, 26c, 31, 32, 33, 34, 35, 36a, 36b, 36c make with the surface device 10 rests on will influence the shape of planar legs 20, 30.

When in this patent application including in the claims the knives or utensils are referred to as being at an angle to the surface that the carrying case is standing on when the knives or utensils are located in the pockets, it should be understood that the term "angle" includes as small an angle as a few degrees and as large an angle as 90 degrees (or more than 90 where the surface is not parallel to the floor, as described in detail in the following paragraph). Having said that, the

preferred angle that the knives or utensils make with the surface is between approximately 10 degrees and approximately 40 degrees. Furthermore, the ideal such angle is probably between approximately 15 or 20 degrees and approximately 35 or 40 degrees. This is simply to maximize the ease with which a chef could single-handedly grab the handle of a knife and remove it from the pocket while the carrying case is in a standing position. Chefs do not always have two hands free when they are working and have a sudden need to take a knife.

It should be noted that normally it would be more awkward for a chef to quickly remove utensils from case 10 if the aforesaid angle (that the utensils make with the surface that case 10 is standing on) is significantly greater than approximately 40 degrees. Nonetheless, carrying case 10 of the present invention has so many advantages that a carrying case 10 having an angle as described significantly greater than approximately 40 degrees would still be advantageous in general and hence it is contemplated by the present invention to have embodiments in which this angle exceeds approximately 40 degrees or even approaches or equals 90 degrees. Furthermore, there may be unusual situations where the surface that the case 10 is resting or standing on is not parallel with but rather is at angle of  $\theta$  degrees with the floor or other surface that the chef is standing on. In such a case, the ideal angle (that the utensils make with the surface that the case 10 is standing on) for working with the knives in case 10 would be up to approximately 40 degrees plus  $\theta$  degrees (or minus  $\theta$  degrees, depending upon which way the floor is bent relative to the surface the case 10 is resting on).

The present invention does contemplate that the pockets and the knives in the pockets would be exactly parallel to the surface that the carrying case rests on. However, that would just be less than ideal since it is easier to grab the knives from the pockets single-handedly when the

# Turner- Chef's Knives Carrying Case and Working Platform

knives and pockets are at a somewhat small angle, as defined above, with said surface.

When this patent application refers to legs 20, 30 as planar, it means substantially planar or sufficiently planar to hold flat utensils in pockets alongside legs 20, 30. The present invention certainly contemplates that a portion of legs 20, 30 can lie outside the two-dimensional plane of the leg or that all or a portion of said leg 20, 30 could be somewhat curved around the plane provided it was not so curved as to render impractical the insertion of flat utensils such as knives into pockets along said legs 20, 30.. The present invention further contemplates that legs 20, 30 may be small in one of its two dimensions relative to the other dimension of the plane. The term "substantially triangular cross-section" used in the phrase "three dimensional hollow area of substantially triangular cross section between the surface and said legs" refers to the fact that even if the surface is not entirely flat the hollow area is still substantially triangular in cross section since the planar legs are substantially planar.

Device 10 stands on planar legs 20, 30. The angle of legs 20, 30 to the surface the device 10 is resting on can be adjusted by pulling the legs 20, 30 apart or conversely by moving them closer together. In standing position, front edge 29 of leg 20, front edge 39 of leg 30 and the edge of the surface that device 10 rests on form an isosceles triangle. The angles of that triangle can be varied by adjusting the width of the legs - pulling them apart or pushing them closer together. Typically, the sturdiest position is where the edges 29, 39 of legs 20, 30 are longer than the surface edge.

In order to allow device 10 to stand with sufficient friction so that the chef can pull knives out of the pockets single-handedly and return them single-handedly, the bottom of planar legs 20, 30 is fitted with a non-skid material 99a, typically rubber. Ideally, an FDA approved skid-

resistant material such as rubber should be used.

First planar leg 20 has embedded therein a first magnet 93a and second planar leg 30 has embedded therein a second magnet 93b. The second magnet 93b is aligned with the first magnet 93a so that the first and second magnets 93a, 93b would have a magnetic pull toward each other when the carrying case is in a closed position. In this way, carrying case 10 can be attached to a metal door or surface in a vertical position and thus function as a knife block.

Preferably, entire case 10 (and especially planar legs 20, 30) is made of leather (except for any magnets). However, case 10 may also be made of plastic, canvass, neoprene or any other suitable materials that allow case 10 to stand on its own on a surface with enough stability that someone could pull knives out single-handedly when planar legs 20, 30 are spread somewhat apart. It should be noted that even without non-skid material 99a, case 10 will stand on its own and allow an individual to single-handedly remove the knives and utensils in the pockets of case 10.

Kitchens are becoming increasing sophisticated environments technologically. It is also contemplated by the present invention that the carrying case 10 of the present invention can optionally include a computerized system by which the chef can monitor the workload of those working for him in the kitchen and communicate instructions to his workers based on the workload. For example, let us assume there are forty workers working for the chef. One of them is dicing tomatoes, one of them is peeling potatoes, one of them is slicing eggplants for a salad and each of the others are performing other defined tasks for the chef. Once a task is complete the worker inputs that fact on his or her computer screen and that information is relayed to the chef's computer on a display screen showing all tasks and which of them are complete. That



would dramatically improve upon the present cumbersome method of hearing about the end of the task from the worker. The chef could then more quickly assign a new task to the worker who completed his task. Similarly, if the task needed to be changed, the chef could signal the worker to change the quantities of potatoes to be peeled without having to walk over to the worker.

The system would include at least a structure for inputting information that can be transmitted to the chef's computer, a display structure on the chef's computer and a two-way communication structure that emanates from a single main hub (representing the chef) outward to a series of local points, each representing a different worker for communicating and updating information between the chef and the chef's workers. The system would include software and a computer located in a portion of the working platform used by a managing chef for communicating to associate chefs who would have a receiving member such as a head set. The computer would emit an audible sound when information is received from another computer or transmitter in the system.

It is to be understood that while the apparatus of this invention have been described and illustrated in detail, the above-described embodiments are simply illustrative of the principles of the invention. It is to be understood also that various other modifications and changes may be devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof. It is not desired to limit the invention to the exact construction and operation shown and described. The spirit and scope of this invention are limited only by the spirit and scope of the following claims.